

does not occur after accidents unless there is a fundamental defect predisposing to hernia.

DISCUSSION

NORMAN H. WILLIAMS, M. D. (1052 West Sixth Street, Los Angeles)—In his analysis of the causes of pelvic relaxation and prolapse Doctor Vruwink has by direction and implication developed prophylactic as well as remedial measures which, if carefully practiced, would diminish many of the ill results common in obstetrics. The mortality in obstetrics can be fairly well estimated, whereas the stupendous amount of morbidity can only be surmised. That it is all too common, however, is the daily observation of physicians. To be sure, there are inherent and constitutional factors predisposing to these results. On the other hand, much can be done to reduce the acquired injuries attendant upon childbirth as suggested in this discourse. The science of obstetrics has progressed slowly, as compared with many other branches of medicine. In prenatal care and in the application of aseptic principles its development has been greatest. Probably the most important phase for future progress lies in the reduction of maternal morbidity. This will develop only as higher ideals are formed and maintained by those engaged in this practice; as more and more the commonplace evaluation placed upon it by both physician and the nonmedical public gives way to its rightful place among the other branches of medicine; when there are fewer who practice mainly to retain the family clientele and more devote their entire energy and intelligence to it as a specialty.

HENRY A. STEPHENSON, M. D. (516 Sutter Street, San Francisco)—The essayist has indeed covered the subject in a most thorough and efficient manner. His division into constitutional and acquired causes is very good.

Inasmuch as the acquired causes are to a very large extent preventable, it seems to me that we should give most of our attention to them. The following seem to me to be the ones most often concerned in this particular condition:

1. Confinements in rapid succession.
2. Haste in delivery, particularly operative cases.
3. Neglect of lacerations in the anterior portion of the vagina, even when they seem very superficial.
4. Allowing patients out of bed too soon after delivery.
5. Malpositions following confinement.

The obstetrician and physician doing obstetrics should try to avoid these five factors, and by so doing prevent, in the majority of cases, pelvic prolapse.

Teaching of Gastro-Enterology in Our Medical Schools—In order to determine what position, if any, gastro-enterology occupies in the curriculum of undergraduate medical schools, Sidney K. Simon, New Orleans (Journal A. M. A.), collected information by means of a questionnaire. An analysis of sixty-six replies received shows that sixteen schools have made provision for a special place for gastro-enterology in the curriculum. In thirty-five schools special hours are devoted to the subject. In six schools a chair or subchair of gastro-enterology has been established. Simon is of the opinion that gastro-enterology is now in a position to press its just claim for recognition on the curriculum of the undergraduate school. He agrees with the prevailing sentiment of the authorities on medical education that a certain concentration of authority in the major clinical branches, three or four at the most, is necessary in order to conform with the real intent of undergraduate study, namely, to turn out general practitioners of medicine. Each special subject, though treated as a distinct subdivision, should be brought under the centralized control of the departmental chief. Nonetheless, the fact remains that gastro-enterology is fairly entitled to recognition in the plan of undergraduate teaching, and it is equally undeniable that instruction in the subject is best given by those possessing special training and experience in this particular field of work.

Of the 7000 prisoners in federal penitentiaries, 35 per cent are violators of the narcotic law.

COMPLICATIONS FOLLOWING PROSTATECTOMY

By J. C. NEGLEY *

DISCUSSION by W. B. Parker, Los Angeles; Edward W. Beach, Sacramento; R. L. Rigdon, San Francisco.

THIS résumé, from the records of the Los Angeles General Hospital, covers the work of the entire staff from the oldest senior to the resident urologist and includes only cases of simple benign hypertrophy that had complete removal of the gland by the suprapubic route. No cases are included which developed complications after leaving the hospital, and most of them were under observation for a month or less. In all, 250 patients were operated upon. Bronchopneumonia occurred in 11 patients; myocarditis in 3; pyelonephritis in 3; peritonitis in 1; and hemorrhage in 2. Of the less serious complications, epididymitis, seven single and two double occurred in nine patients. Seven patients had residual urine, six of them had a half-ounce or less, and one had three ounces. Suprapubic fistula occurred three times in patients with residual urine. Contracture of the bladder neck troubled one patient; psychoses occurred in two patients, one of whom had a four plus Wassermann; and the other, from his history, had been somewhat subject to transient attacks of mental aberration for fifteen years.

Bronchopneumonia—In both the fatal and milder cases, bronchopneumonia began on or after the ninth postoperative day. As all patients had spinal anesthesia, the cause of the pneumonia cannot be laid to bronchial irritation from general anesthetic. Most of these patients had respiratory infection with coryza, sneezing, sore throat, and later a cough. It is a question whether such pneumonias originate with the patients from some already long-existing foci, or from sources outside the body. Since the vast majority of these patients have infective foci somewhere, it is my opinion that most of the bronchopneumonias originate in the patients and not from outside sources, so that prophylaxis against this complication must be directed against things existing within the patient. Infective foci should be removed, resistance built up and, above all, these debilitated old men should be kept in bed for a week or ten days and not subjected to exposure or exhaustion in the first few days after operation. All irrigations, dressings and treatments also should be done in bed for the first week at least. Needless to say, no patient with even a slight cough, rales, recent bronchitis, or other respiratory infection should be operated upon until he has fully recovered. Care should be taken that the patient does not have abdominal distention to such an extent as to cause pressure upon the diaphragm, thereby causing shal-

* James C. Negley (809 Haas Building, Los Angeles). M. D. University of Michigan. Bachelor of Philosophy, Westminster College, 1906. Practice limited to Urology. Hospital connections: Los Angeles General, Pacific and Clara Barton hospitals. Appointments: Consulting Urologist, Pacific Electric Railway. Publications: "Calculi in the Kidney and Ureter," California and Western Medicine, 1923; "Spinal Anesthesia in Urology, with Review of 5500 Cases," California and Western Medicine, 1924; "Complications Following Prostatectomy," California and Western Medicine, 1925; "Syphilis in Pregnancy," Urologic and Cutaneous Review, 1922.

low breathing. Repeated hypodermoclysis under the breasts also at times causes so much pain as to bring about shallow breathing. This is given as one of the causes of postoperative pneumonia, i. e., the incomplete inflation of the lungs over comparatively long periods of time. Isolation and special nursing many times will save these patients even after pneumonia has become established.

Myocarditis—Prophylaxis against this complication should include digitalization of the patient or other heart stimulants should be used. Spinal anesthesia always should be employed. No patient should be operated on with a blood pressure at or near 100 systolic. Postoperative dangers are minimized by sustaining the blood pressure during operation and afterward by appropriate measures. We should guard against the injection of large amounts of fluid quickly. Giving 1500 or 2000 cc. of solution intravenously in a short space of time may precipitate trouble. Nor should we in our zeal to have the patient drink fluids force him to take more than two or three ounces at a time. Copious draughts of a pint or more of water at a time may lead to acute dilatation of the heart or spells of vomiting, which do not help an already weakened myocardium. Fluids are best given by hypodermoclysis or proctoclysis, to insure that they are not absorbed too rapidly.

Pyelonephritis is a complication that cannot be foretold by the phthalein test or blood chemistry when the preoperative kidney function is near normal. Most cases of pyelonephritis occur in patients who have a low but stationary phthalein output and in whom the bladder urine is highly infected with many different types of organisms. I do not believe that a ureteral catheterization is necessary before prostatectomy, but I am beginning to believe that ureteral catheterization in those patients with highly infected bladder urine is indicated. If examination shows one or both kidneys heavily infected, prostatectomy should be deferred even if the phthalein and blood chemistry findings are within the limits of safety.

Hemorrhage—Only rarely does a patient die from hemorrhages at the time of operation or shortly afterward. However, hemorrhage may, by lowering the resistance, prepare the patient for some other complication. This hemorrhage may be best prevented by the so-called open operation where the operative field is under direct visual control, and all ragged edges and tags can be removed and the edges sutured with a continuous or interrupted catgut suture. A Pilcher or Hagner bag against the prostatic fossae is the most efficient and least disturbing agent we have for the control of hemorrhage. Packing the entire bladder cavity with gauze is also efficient, but leads to varied degrees of tenesmus and pain and not inconsiderable shock on removal. Many and varied agents, either locally or by hypodermic needle, have been tried but are uncertain, and if relied on alone certainly are dangerous.

Peritonitis fortunately occurs in but a small number of patients and generally is the result of an accidental tear of the peritoneum. This is an acci-

dent which happens not infrequently, but if recognized and repaired seldom leads to complications.

Infection, including that about the wound, perivesicular, or in the space of Retzius, producing phimosis and scrotal cellulitis, makes this complication one of the most serious we have to deal with. It is entirely unnecessary if close attention is given to basic surgical principles. Many contend that it is impossible to operate without infection where urine and other purulent material must come in contact with the wound. This is true, but only relatively so, for if one reduces the size of the space likely to become infected he thus reduces the amount of the infection. This is best accomplished by an anchor suture through muscle, fascia and outer bladder wall just at the top of the space of Retzius so as to close off this space. This obviates a drain in this space and does not make of it a pocket which, when filled with infected material, makes of it a perfect bacterial incubator. Too much exposure of the bladder wall laterally should not be attempted, and in fact before the De Pezzer catheter is put in place, the space surrounding the incision area in the bladder should be watertight. Exponents of wide exposure of the bladder will contend that proper drainage will take care of any infection. This may be true, but if we eliminate dead spaces, infection and extensive drainage are unnecessary.

Epididymitis—This complication in a well-performed prostatectomy is annoying, and while it does not lead to fatalities it retards recovery and causes pain and lowered resistance to an otherwise uneventful case. The only sure way to prevent epididymitis is to perform a double vasectomy at the time of the first-stage operation, or if a one-stage operation, then at that time. Those who do not care to do this very trivial operation, must resort to the adhesive bridge or other mechanical supports, all of which are unreliable and unsatisfactory. Keeping the patient in bed for ample time, and gentleness in instrumentation and treatments help ward off this condition.

Residual urine results from a variety of causes, namely, contracture of bladder neck, failure to remove all gland substance with regrowth of remaining portions, occurrence of malignancy, failure to use sounds often enough and early enough, and occasionally the formation of calculi. Then the failure to get close coaptation of the edges of the wound around the prostatic fossae is probably the most frequent cause of residual urine. Care must be taken that these edges are brought together closely either by suture, the Pilcher bag, or a pack.

Suprapubic fistula generally comes from the same causes as residual urine, and where one is found the other exists. Any patient who has either or both of these complications at the end of a month should have a cystoscopic examination, and if tags or regrowths are present they can perhaps be fulgurated successfully.

Uremia is mentioned in textbooks, recent and late, as the most frequent cause of death. It was not a factor of great importance in my series of cases, and since the advent of blood chemistry and modern

kidney function tests, this complication ought to be ruled out before a patient is operated upon.

Paralytic ileus was not noticed in this series and in fact it is not often encountered. I have had one case and it was due to free use of magnesium sulphate by the patient without orders and too much morphine by the anesthetist before operation and by the nurse afterward.

SUMMARY

The percentage of deaths in this series of cases was 6 per cent. Five of the deaths were due to bronchopneumonia, which followed in the wake of the influenza epidemic raging when these patients were operated upon, and many patients who had other operations died from the same cause. There were three deaths from myocarditis following within ten days of the second stage in two cases, and occurring twelve days after a one-stage operation. Three deaths from pyelonephritis occurring fifteen, eighteen, twenty days, respectively, after the second stage of operation. Two deaths from hemorrhage occurred within forty-eight hours of operation; one a one-stage and the other a two-stage operation. One death from peritonitis occurring six days after a second-stage operation. One death from extensive cellulitis extending laterally to the bladder, in the space of Retzius, and into the scrotum three weeks after second-stage operation. Of the lesser complications, epididymitis showed a percentage of 3.6. This complication was avoided in those patients that had a vasectomy.

Residual urine occurred in 2.8 per cent, but six of the seven cases had less than an ounce and the other had three ounces. This patient had the further complication of malignancy about the bladder neck. These patients were under observation a month or less and were still having treatment with sounds and otherwise at the time they disappeared from observation, so this cannot be taken as an end-result.

Suprapubic fistula occurred in 1.2 per cent of the patients, but all were included as further complications in the cases of residual urine just mentioned. Contracture of the bladder neck occurred but once, and cystoscopic examination revealed no apparent cause; there were no tags, remains of prostatic tissue or malignancy.

In closing I wish to note as a significant finding in this series of cases that the nonprotein nitrogen in all complicated cases ranged between 35 to 50 per cent, but the other blood chemistry findings, sugar, uric acid, and creatinins were normal or nearly so. The phthalein test also was near normal in all these cases. This would lead one to believe that the non-protein nitrogen factor is to be more seriously considered and should make one hesitate to operate on those patients who range above 35 per cent non-protein nitrogen, even if all other factors are normal or nearly so.

DISCUSSION

W. B. PARKER, M. D. (Brack Shops Building, Los Angeles)—This report from the records of the Los Angeles General Hospital reflects great credit on the entire urological staff. These statistics are comparable with the records of any large hospital of similar character re-

ported to date. The percentage and average of complications are considerably less than any previously reported. All recent series reports of individual surgeons and hospitals show complications of major degree to be more infrequent. This is a gratifying consideration, undoubtedly due to careful diagnosis, better preparation and standardization of technique and post-operative care. Unfortunately no surgical patient is subject to so many complications as those operated on for prostatectomy. Despite this fact, urologists in recent years have placed prostatic surgery, perineal and suprapubic, as among the most definite of specialties.

Anesthesia is another factor of great importance, with a range of selection, which should satisfy the most meticulous in their choice of what they consider the safest for the individual patient. Local, spinal, nitrous oxide oxygen, and ethylene gas in their order seem to be those of choice for all types of prostatic and bladder surgery, especially for the known bad surgical risk.

Doctor Negley offers a very reasonable explanation as to the frequency of bronchial pneumonia, excluding the epidemic of influenza. Apropos of focal infection influences in the production of complications, following prostatectomy, great care must be exercised in their eradication. Liability of complications is always increased if focal infections are disturbed too close to or following prostatic surgery. Where any degree of emergency exists, wisdom will be shown in deferring all interference with focal infections until the attainment of a metabolic balance of safety, as referred to individual resistance.

Myocardial insufficiency, a frequent complication of the most embarrassing type, has been elucidated freely. Its occurrence, preventable to a degree by pre-operative care and digitalization, often occurs irrespective of the fame of the operator. Numerous recently reported fatalities should teach surgeons that all are born with only a definite amount of reserve to which no one can add a single iota. Conservation of reserve is responsible for the life expectancy of many post-operative prostatitics who are alive. Therefore it is almost needless to add that the future overly ambitious operator may enhance the permanency of his reputation, built up in fields of less responsibility, by refusing prostatic surgery.

Before continuing the discussion, I must confess that a statistical resumé is the most difficult of all in which to render justice.

Epididymitis is preventable by vasectomy. British urologists have practiced vasectomy as a preventive of epididymitis for several years. Dr. Granville MacGowan, consultant of the urological staff, has successfully employed this method for many years.

Acute urinary retention of prostatic origin should not be subject to immediate surgical drainage, except in cases where it is impossible to enter the bladder through the urethra. In such instances, suprapubic drainage is much to be preferred for safe decompression of bladder retention.

The present use of the indwelling urethral catheter for the preparation of cystostomy has been found invaluable, thereby establishing a three-stage prostatectomy, especially applicable to institutional urology. Noticeable exceptions to the use of the indwelling catheter in preparatory relief of prostatic retentions are: hemorrhage with clots; calculi with or without a gangrenous type of cystitis. Should the operator attempt any surgical relief other than a suprapubic cystostomy in the latter, he is to be pitied more than censured. In this type of retention, a properly performed cystostomy with extreme care as to the protection of the space of Retzius will be most appreciated. Perivesical infection anteriorly or laterally is almost inexcusable. The simple technique of protecting the perivesical tissues from infection greatly lessens the difficulty of approaching the prostate for enucleation, the bladder neck for punch removal, or the trigone for section.

The general consensus of opinion in reference to blood chemistry findings and their interpretation as to operability and accuracy of prognosis, excluding the subjective element of an individual urologist, is that the blood urea is the most sensitive and variable of the accepted group and subject to the greatest amount of error. Creatinin is the most fixed of the entire group, requiring longer in-

terpretation and more experience. Nonprotein nitrogen clinically is next, in a majority opinion of urologists. Salivary urea is unquestionably an excellent guide, and has many exponents. Combined they are possible of interpretation to a high degree of accuracy. All are subject to error singly. Exclusion of the group and the preference of one would appear to be as fallacious as disregarding blood chemistry findings entirely.

The stability value of the phthalein test applied to prostatic obstructions is subject to more variation and confusion than comparative phthalein tests applied to differential renal function for kidney surgery, the latter probably correlated with nature's compensation concerning bilateral organs, where actual knowledge remains as yet a theory.

In reviewing the literature of complications following prostatectomy with special reference to functional results, one must conclude that a number of the most distressing failures are due to an inability to visualize the mechanics of a postoperative bladder. Excluding inoperable pyonephroses, diverticula, and central nervous system diseases, a sterile urine, an easily emptied bladder with at least some reduction of frequency, should be the end-result of prostatectomy. By far too great a host have been bemoaning their poor results, due to operation by untrained surgeons, and, let us add, by urologists of the bizarre type; those, who for self-advertisement, refuse to accept well-defined methods or recognize well-established entities, simply because their name is not signed to the original article. The future better results in prostatic surgery will increase rapidly, with lessening of complication through research and standardization of technique regardless of the method of approach.

As to delayed healing, fistula and residual urine, either after suprapubic or perineal prostatectomy, most operators find there are a small percentage of patients who form granulation tissue too rapidly or with marked retardation. The endless grief of the one about offsets that of the other. Long experience probably will not aid one in forestalling a postoperative obstruction to the urinary outflow. Such a condition is just as capable of the production of partial incontinence. Fibrosis, anular and linear, or without atonicity is strictly mechanical, often remediable by discerning clinical and diagnostic means.

EDWARD W. BEACH, M. D. (304 Plaza Building, Sacramento, California)—This paper pays tribute to the skill and clinical judgment manifested by Negley and his surgical colleagues in their management of prostatic cases at the Los Angeles General Hospital. The mortalities listed in these 250 cases but confirm one's opinion that prostatectomy with our modern diagnostic aids, with our modern understanding of blood chemistry and pathology, is truly one of the "safest" of all operations in experienced hands.

I am glad to hear Negley stress the elimination of all focal infection as a link in the chain of pre-operative preparation. Certainly, oral sepsis is vitally important in all cases, especially those in which a general anesthetic is to be administered. This is perhaps more important than the many factors he has mentioned in the postoperative cases to forestall bronchopneumonia. Another factor to be considered in postoperative chest conditions in these cases is the frequency of pulmonary embolism which, I believe, is sometimes mistaken for bronchopneumonia. Prostatectomy particularly favors pulmonary embolism. It is perhaps more often seen in these cases than following any other surgical procedure and necessitates the obviation of all except very urgent rectal manipulation following operation.

To me, one of the most important complications, and quite the most serious, is hemorrhage. In doing suprapubic work we had been using the gauze-packing method up until a short time ago. This method controls hemorrhage well at the time of operation; but in removing the gauze, in stages (not to mention the pain incident to withdrawal), it is quite the usual thing to produce varying degrees of secondary bleeding even six to eight days after the operation. Repacking is most difficult. It is also most painful, and frequently requires an anesthetic. Having had two patients with frightful hemorrhages, one of which ended disastrously, I cast about for a method other than gauze or bag. The method I am now using is not original, but is closely related to that suggested

by Schoonover, with certain modifications. It consists in using the Judd retractor and a third inferiorly over the pubes to obtain a good view of the intravesicle enlargement and the orifice. Two deep chromic sutures are placed in position, postero-laterally to the orifice at the side of the intravesicle tumor and tightly tied. A clean circular cut is made about one-half inch medial to the border of the adenomatous tumor through the vesicle mucosa, and this dissected back to the edge of the adenoma. The finger then breaks through anteriorly and enucleates the prostate in the ordinary way. The dissected mucosal edge is fastened with several deeply placed interrupted sutures to and over the edge of the fossa left after the removal of the gland. In this way, very little bleeding is encountered. Even before the last sutures are placed the first two sutures control most of the bleeding. Oozing is easily controlled by hot sponges and pressure, and rarely are suture ligatures necessary other than the above. This method has an added advantage, in that it tends to do away with mucosal tags and irregularities which, at times, distort, deform and even obliterate the orifice following operation, thereby leading to a permanent suprapubic sinus and residual urine or a contracted vesicle orifice with the attendant symptoms.

I believe this method facilitates rapid healing and certainly is a decided advantage over bags and gauze.

R. L. RIGDON, M. D. (291 Geary Street, San Francisco)—Doctor Negley has presented a paper that is well worth reviewing. It bears the earmarks of veracity, and no doubt gives a true picture of the results of prostatectomy as done at the Los Angeles General Hospital by men trained in that work, assisted by a staff that is also trained in the care of these patients. Evidently there was no selection of cases, other than to determine the diagnosis of benign prostatic hypertrophy. Nothing is said of the age or other condition of the patients, but we presume these factors were such as would be found in any large general city hospital.

The mortality is given as 6 per cent, or 15 out of 250. Five of these died of bronchopneumonia following a "flu" epidemic. The onset in these patients was such as to suggest a fresh infection; certainly it was not the onset of any ordinary postoperative pneumonia. It is very probable that all of these deaths should be attributed to factors lying outside the operation. In my experience, the so-called postoperative pneumonia never comes on with coryza, sneezing, etc., but manifests itself by cough, rise in temperature, and pain. It is my opinion that in a large number of my own cases in which post-operative pneumonia was diagnosed the true etiology was to be found in emboli or infection from the wound area.

Blood pressure is certainly a sign that should be taken into account. Thomas showed by statistics that a good pulse pressure was a very valuable aid in securing a satisfactory convalescence.

The control of hemorrhage is also important, and in some instances is not as easy as is pictured. Immediate hemorrhage should be controlled before the patient leaves the operating-table. As yet we have not attained to the ideal in this particular. The subject needs further study.

It is pleasing to know that vasectomy does away with epididymitis. So far, I have relied upon well-arranged support for the testicles so as to avoid all congestion, but in spite of this, epididymitis does occur. Double vasectomy is certainly worthy of a thorough trial.

DOCTOR NEGLEY (closing)—In closing discussion, my colleagues have left little for me to say.

Thanking Doctor Rigdon for his belief in the veracity of this report and answering him as to age of patients, all had reached the "prostatic age," i. e., over 55 years.

His statement that true postoperative pneumonia almost always comes from emboli or infection from the wound, is very true and emphasizes the fact that the wound should be made clean and kept clean by closing off the space of Retzius at the time of the first stage of operation.

Physicians must give a new significance to the word patient, for in the new order of things both sick and well people must and will be recorded in the lists of their physicians.—Wendell C. Phillips, M. D., Journal A. M. A.